Retrieving Graduate Revenue from the Edge:
Solving Inequitable Socialization for Masters and PhD Students with Graduate Technology Supported Platforms

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Abstract

Universities in the United States throw billions in revenue from graduate tuition away every year because the university, as an organization, is too timid to take on new technologies when they are offered. That graduate education is unequitable is no secret (Barker, 2011, Espino, 2008). While graduate recruitment focuses on ever wider populations, completion is still sadly lacking for those students who are more mature, racially or culturally diverse or non-native English speakers, not to mention the weaker student or one struggling with personal issues. Add to that issues of ambiguity, work/life balance, independence, development and support and you have a recipe for graduate student disengagement. Aggravated by challenges of inclusion and/or diversity in graduate schools, inequity and failure thrive the more incomplete the socialization the student receives or the more complex the program they enter. The purpose of this article is, first, to address the issues of noncompletion and inequity from the perspective of the newest elements in socialization

theory. Second, to discuss graduate technology support platforms to address the inequities that cause disengagement. A new conceptual model is suggested, suggesting where and how technology supported (or enhanced) learning can be employed and empirical evidence of the success of such a model is introduced. Results suggest that students are ready, in fact eager, for their universities to provide these services and that they are efficacious as a safety net for students who would otherwise disengage.

Keywords: graduate education, graduate retention, graduate completion, dissertation help, thesis help, graduate socialization, graduate student experience

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Background

The reader may think that saying that (post) graduate education is at the edge is harsh, however billions in revenue drain out of graduate schools and departments in US universities every year, and with up to (some say over) 50% of students non-completing, you can't deny there is an issue here we should do something about. Let's look at the math:

1. There are 504 universities with graduate programs that each enroll over 1600 students; totaling 1.8m students in all (figures from Higher Education Database, 2016).

2. Their graduate tuitions average $12,000 (12k) a year, however 129 of those each have graduate tuitions more than $23k and over 50 have graduate tuitions more than $45k.

3. Considering this range and adding them up through the mean enrollment of each, 129 universities take in revenue totaling over $18b and, when the other 365 are added to the mix, with the mean revenue of $12k per student per year, together they total $34m.

4. Graduate education in the United States is a $34b revenue stream overall and for many universities it as a profit center.

With that much money at stake, why aren't our university presidents screaming that something

needs to be done to improve completion rates now? It is widely quoted that 50% of graduate students who enroll will not graduate (Abernathy, et al., 2008; Christensen, et al, 2008; Di Pierro, 2012; Erickson, et al., 2004; Gardner, 2008, Lovitts & Nelson, 2000). Even if we assume those are lower tier universities than the example above and we only think 40% will abandon their degree work (Nerad, 2007; Van de Schoot, et al, 2013), noncompletion equates to $13.6b in lost revenue every year. However, it is more than lost revenue, isn't it? As one administrator told me, "It isn't good for anyone, not the university, the student, their families or the moral of our faculty" (James, 2015). Also, graduate completion is not an equilateral issue either (Gardner, 2010). Top tier universities and some types of departments have less of an issue, Humanities and Education departments more, and online universities struggle the hardest (James, 2015c).

The people who run graduate school offices or departments are responsible for monitoring registration, enrollment, and support of the socialization or training of students. What most have done in answer to the issues of non-completion is to track students more carefully through CRM related options. While this catches some students, it does not address the underlying organizational development issues: gaps between program guidelines, current management, diversity among faculty experience and approach, and points or styles of delivery to students.

Some of those gaps occur because working with students is traditionally a shared responsibility between the graduate department and specific colleges or departments. The indoctrination of students into graduate level critical thinking, analysis, research design and academic writing is usually split in different ways between them. This means no one system is focused on graduate student experience. That must change or the revenue figures will always show this level of loss.

This article suggests a centralized graduate technology support platform can ease the tensions of those students thinking about disengaging, while not disrupting the flow of work through faculty and departments. Two topics are covered: first the research behind the challenge of non-completion and then how socialization theory can be employed with technology supported platforms to fill those gaps.

Non-completion is not an equitable experience, and we never know who will specifically be the ones to disengage (Ellis, 2001; Erickson, et al., 2004). We do know that minority students, non-native English speakers, international students from non-Asian countries, part time, mature, and working adults all are at significantly

greater risk of non-completion than others (Barker, 2011; Eisenbach, 2013; Espino, 2008, Spaulding, Rockinson-Szapkiw, 2012; Vekkaila, Pyhältö & Lonka, 2013).

Equitability is, of course, the challenge of the modern university. There is no argument that previous models of graduate program delivery were apprenticeship based (some would say this is an archaic model) and required much more interpersonal interaction than it is now possible or affordable to deliver. Isolation of some, if not all students, at least during portions of their degree seeking tenure are the result (Gardner, & Gopaul; 2012; James, 2015). Isolation and the inequitable practices as seen through the experiences of the diverse student are closely linked to disengagement (Gardner, 2009).

The graduate market has changed in the last decade. The potential represented by online, blended, and part-time options for graduate education have opened the mature, working professional to opportunities for advanced or terminal degrees. The non-traditional student is a growth market for most graduate programs (Erickson, Howard, Borland & Baker, 2004; Nerad, M., 2007). Because the skills needed for a graduate work closely match those required by innovation (employing critical analysis based on literature and data), it makes sense that many university departments are expanding their degree options to meet the needs of these students.

Most, if not all, universities recruit from other locations, encourage racial and cultural diversity, take grants, and apply for funds to support the socio-economically disadvantaged. At least some departments will actively recruit the mature student, who likely is working full time, has a family and other responsibilities and for whom the idea of graduate education is inspiring. The distance from the recruiting or admissions office to the program chair to the advisor can seem interminable with each taking a different role and assuming the others will "work it out" once the student arrives. As dropping completion rates suggest, some are much better able to do that than others (James, 2015c, Tinto, 1975; 2002, 2010).

This article answers the following questions:

1. What value does a review of socialization have for the 21st century graduate school/office in terms of equitable practice, quality assurance and the potential for raising completion rates?

2. What part can graduate technology supported (or enhanced) platforms play in pragmatically addressing these challenges?

From these answers a new conceptual model develops through which educational leaders may assess their current and future solutions. Empirical evidence is offered that students are ready for these

new types of online supports. The question then is: are our organizations?

Forty Years of Socialization

Van Maanen and Schein, E. H. (1978) paved the way for the hundreds of articles over the last 40 years that verified socialization theory as a key to addressing disengagement from organizations and higher education. Research continues to study the process and relationships through which students adapt (or not) and become committed (or not) to both the explicit and implicit roles and demands of graduate education. Quality socialization allows the individual to pick out what is important, change behavior, adopt a new stance or routines, and approach a set of work in a way that allows them to achieve the desired result, in this case graduation.

What is important but not well considered in higher education is that socialization has two roles to consider first, the actor (the university and all its support systems) and the one acted upon (the student). Most research addresses the later role rather than that of the actor. To quote a dean of graduate studies in a recent interview: "At our institution I don't think we are intentional about socialization. If we think about it at the program level we just think it happens. When students fail to engage, we don't ask ourselves what may be wrong with our set up that contributes to this outcome" (James, 2015).

As a mature theory, socialization has much to offer higher educational management if and to the extent we are prepared to look at the actors' role in the equation (Van Maanen & Schein, 1978). What if leaders in higher ed considered the gaps in their systems and tried to fill them? What tools might come to light, what new solutions might be tried? Most importantly how much revenue and personal costs could be recouped?

Higher education needs to take a look at the principles of thought and action from socialization theory, which lead to new, pragmatic and inspiring ways to improve our universities ability to be equitable in graduate teaching practices. To the extent that our leadership can move past the archaic and into the innovative, entrepreneurial, and technological this author believes there will be a new age in graduate education, one that ensures success for increasingly large interdisciplinary, inclusive and international student populations (Boden, Borrego, & Newswander, 2011).

Exploring a Particularly Pragmatic Theoretical Model

Student disengagement has been studied for 40 years with little conclusive or pragmatic outcomes. A theory's purpose is to tell us where to look for more evidence, describe the forms of what is studied for further development, and offer explanations (Van Maanen & Schein, 1978), yet it

is only recently that the reams of evidence could be condensed into a coherent whole. Gardner's (2006, 2008a, 2008b, 2009, 2010) conceptual framework of five entangled variables (ambiguity, balance, independence, development, and support) tells us where to look for more evidence and from that we can extrapolate what can be done from the actor's (university's) position. By first sorting the multiplicity of previous findings, we uncover evidence that points to how/why technology can be beneficial in equalizing socialization for the most at risk students.

Follows is a discussion of these five categories, first merging selections of literature, then as seen through the lens of what tools would be helpful to each concern. This article suggests the implications for a conceptual model for the development of graduate technology support platforms and offers preliminary empirical evidence for consideration.

Ambiguity. Educators responsible for designing graduate programs may or may not give much thought to their underlying pedagogy or ontology (Abernathy, et al., 2008). For instance, graduate school or department heads may subscribe to logical positivism or empiricism and will view the world, and therefore, design a program with much different assumptions than others who favor hermeneutic, interpretive, and postmodern or critical approaches (Van Maanen, et al., 2007). Add to this a variety in backgrounds, some professors employing a deep understanding of strategy and project management and others not, and you see the tip of the iceberg that plays out in huge variance, even within an institution, of the programmatic guidelines to which graduate student must work (Gardner, 2006).

This ambiguity across processes is apparent in the figures when they are disaggregated relating to gender, race, or nationality and timely graduate completion (Felder, Stevenson, & Gasman, 2014; Lovitts, & Nelson, 2000; Van Maanen, et al., 2007). Full disclosure of their confusion, or calling into question the ambiguities they experience, is risky for students, especially when historically the director of the program is a person of what would be someone from a traditional ruling class, making the entire relationship with graduate education idiosyncratic (Daniel, 2007; McKinley, & McKinley, 2011).

The importance of this variable can be seen by studying student disengagement. Research demonstrates that the counteragents to it (engagement, absorption and flow) are not possible in a context of ambiguity (Gardner, 2008; Vekkaila, et al., 2013). We'll view this again later when we discuss technology as engagement becomes an important, yet easily measurable variable.

How then, to design and manage programs

that provide adequate support past the ambiguity that is likely embedded in all university processes? How to ensure students can navigate the variance in academic backgrounds and diverse student populations? First, it is suggested that university management consider the range of needs of students and design flexible pedagogical solutions, allowing for non-traditional paths through to completion (Eisenbach, 2013; Gardner, 2010; Gonzales, 2006; Gordon, 2014; Tharp Byers, et al., 2014). Second the processes involved in completing the degree need to be deconstructed and re-explained in as many ways as possible. This includes being available 24/7, and delivered by parties that do not have direct power over the student (Felder, 2010; Jazvac-Martek, 2009; Thomas-Long, 2010).

Balance. Research has taken many directions when studying the personal difficulties encountered by students that have be correlated to disengagement fall under Gardner's category of balance. Most are discussed under headings of personal reasons or changes in circumstances (Abernathy, et al 2008; Girves, & Wemmerus,1988). Looking from another angle, the students who are isolated or see themselves as outsiders, or who wonder about the overall lack of relevance of their degree, (all seen as precursors to disengagement) can be related to students who never found the proper work/study balance or who experienced

stress, or partial failure (Daniel, 2007). University campuses frequently see constant graduate traffic to their mental health services, and psychology may account for failure at a personal psychological level (Blum, 2010). Too much compartmentalization of life as a coping mechanism adds to the stress and self-doubt in students as well, challenging students' ability to balance the complex life commitments that are more common in mature students (Felder, 2010; Jazvac-Martek, 2009).

Wherever you place the root cause of these tensions, designing interactive situations that allow a student to perceive that they are not alone, that they are more competent than they realize and giving them multiple options to interact with others, again on a neutral ground, will go far in increasing student engagement (Vekkaila, et al. 2013). Students find comfort knowing that stress due to time, work, family, and finances and all the struggles with time management, internships etc. are not uncommon and can be navigated to their satisfaction through multiple channels offered personally and online (James, 2016).

Independence. This variable covers a myriad of personal and interpersonal responses required to find equilibrium as the student transitions to the role of independent thinker/writer/ researcher (Gardner, 2006, 2008, Weidman, Twale, & Stein, 2001). Contributing in an authentic way

as a researcher was reported by graduate students to contribute to engagement by 11% of graduate students in a Finnish study, while 13% reported individual acts of autonomy enhanced their engagement (Vekkaila et al, 2013, Williams, 2012). These studies, and others, indicate that to make it through this rite of passage into independence, students need to be allowed freedom (Abernathy, et al., 2008; Gardner, 2010). Yet how should the university set up freedom so that it is enough but not too much? What kind of supports can provide a safety net but don't waste the time of the student who is on track?

Students who are part time, or at a distance, are more independent and may have more power (Gardner, & Gopaul, 2012; Preston, 2014). At the same time, if they don't properly negotiate the challenge to develop their own voice as researcher they may be more inclined to isolate or disengage at least for a time (Gonzales, 2006; Gordon, 2014). Some student authors remonstrate the need to "reach out to people outside of the school and outside of the university… Make your own connections… don't expect people to know your name" (Felder, 2010, pg. 466).

This brings up the question of what kind of supports are needed to encourage independence AND still nudge students towards the goals of independent research, including: a mastery of the "connections within and between the conceptual (ideas) and the empirical (data) which allow for a logic of discovery rather than only a logic of validation." (Van Maanen, et al., 2007, pg 1146) and how might technology help?

Independence includes building peer level professional relationships across academic systems. These professional relationships can include the university professorial connections as well as those with other students (Tharp Byers, et al.,2014). Again, race and culture can make the self-confidence required to develop these relationships an uncommon concept (Barker, 2011; Ellis, 2001; Espino, 2008; Felder, Stevenson, & Gasman, 2014). This will be true as well for first generation doctoral candidates (Irwin, & Berge, 2006).

Development. Akin to the ability to act independently, the graduate student needs to find ways to develop: significant levels of new knowledge, skills to work innovatively, interpersonal skills to work collaboratively, and the discipline to bring them all to bear on their projects (Gardner, 2006; Felder, 2010). Cognitive development rests on the students maturity and experience linking how methods generate theory or vice versa (Van Maanen, et al., 2007). Intrinsic motivators for students are their accomplishments, and as they pass major and minor milestones competency increases in academic writing, agreement from the ethical review panel, a

successful review, etc. (James, 2015a, 2015d, Tharp Byers, et al. 2014).

Faculty in each department are assumed to hold the collective responsibility to socialize students development as an apprentice is socialized into a craft or trade (Jazvac-Martek, 2009). When students don't develop properly they are at risk of losing their place. Tinto's theories of "fit" assert this is a mismatch between the students' motivation and academic ability and the institutions academic and social characteristics (Cabrera, Amaury, Castafned, 1993; Tinto, 1975, 2002, 2010). Admittedly this disconnect is aggravated by hiring practices as professional expertise is a foremost driver for tenure, not the ability to guide students in the skills of academic writing and critical thought develop through cohort relationships (James, 2016).

There is a difference between races and cultures on the level of independence expected by students in making choices as to their own development. Some international students expect to be required to conform and so the interaction of independence and development becomes a minefield to navigate (Ellis, 2001; Kirillova, et al., 2016). For nonnative speakers and those from decidedly different cultures, repetition may be required to master many graduate skills (Morita, 2000). Even the fact that the graduate student needs to manage their own process is a learned

behavior, one that is antithetical to the expectations of some cultures (Irwin, & Berge, 2006; Kirillova et al, 2016). Therefore, much of a students ability to absorb new ideas and develop in a field may rest on the availability of multiple instances of delivery, helping to overcome culture, distance, and language, hence again the suggestion that universities employ online situations where delivery can be personalized to student needs (Gordon, 2014).

Support. Support is not a magic bullet in that there are many forms it may take and what is completely supportive and necessary to one student will not be useful to another (McKinley, & McKinley, 2011). Especially when budgets tighten what decisions will show the best return on the investment for support? One Ivy League assistant dean reported they put on a week-long dissertation boot camp during spring break for 30 students out of the 6000 they have on campus (James, 2015). Is this a good ROI? How is that experience replicated for more students to attend?

Race, language, and culture all matter when it comes to the type of support that will be accepted by students (Ellis, 2001, Felder, et al., 2014; Gonzales, 2006; McKinley, & McKinley, 2011). Because one size does not fit all, some students look for advisors/mentors or role models who are caring and supportive while others prefer strong field or professional expertise (Barnes, Williams, & Archer,

2010). Likewise because memory is stimulated, requiring multiple sources of input, students may find collaborative learning situations or peer-to-peer mentoring to have positive effects, and in some instances helpful to renew motivation (Cabrera, et al., 1993; Collings, Swanson, & Watkins, Dec2014; Jazvac-Martek, 2009).

Personal life supports are as critical, especially for part time students who are relying heavily on others in their lives to take up the slack created by graduate school with issues such as child rearing (Gardner, & Gopaul, 2012). The best solution is for students to build a personal support system and a professional one and for the two to overlap in their lives seamlessly, thus forgoing the challenges created by compartmentalizing (Gordon, 2014). Flexible pedagogical supports delivered remotely on mobile devices also have a role in this, which will be discussed more in the next sections (Carmean, & Frankfort, 2013; Frankfort, et al., 2012; Thaler, & Sunstein, 2008; Wildavsky, 2014).

How Technology Can Help

The modern post graduate student lives in a world where technology is ubiquitous, yet technology is a world universities have not begun to penetrate in any depth. Surveys show that when asked how they use mobile technology for their academic work, graduate students reported: 21% for motivation or classwork, 40% as a communication tool or for webinars or to receive push notifications, 45% for capturing data, 59% taking notes, 64% reading literature, and 76% managing schedules. Universities in the same survey reported spending technology money on a completely different set of services: 76% on LMS, 53% in plagiarism detection, and then 25% or less on learning aids or technical assistance, 13% reported having employed a CRM system to track student enrollments (James, 2015c).

This section briefly discusses what is known to date about ways technology can be employed to support and enhance each of the five Gardner categories of socialization practices, offering specific tools aimed at filling each set of gaps. Technology is not inexpensive to develop, and the multiple format implementations, suggested by the literature previously discussed, may seem impossible for the single department, even university. By partnering with business returns on investment, can be almost instantaneous and by sharing development across multiple campuses the technology employed can keep current (James, 2015b).

Ambiguity. Technology can be the best aid for issues of ambiguity. International students and those for whom English is not their first language suffer most. Research has shown that online tools were especially helpful in addressing these issues because, through multiplicity of content and the ability to revisit it multiple times, understanding is

finally achieved (Hsu, 2010). Likewise, the older student who is working full time may find their advisor, a lifelong academic, to be "sympathetic but without real understanding of the issues I face" and online groups "welcoming and comforting." The subtleties of research may not be picked up on a student's first introduction to them in a class, causing one mature student to report, "Whenever I feel stuck I always look at the webinars, or attend." "I felt stupid until I attended the online group and it was explained by the facilitator and other students" (James, 2016).

Balance. The value in push notifications is just beginning to be understood. Employed in undergraduate technologies primarily as a nagging reminder system, they develop into new styles of socialization for graduate students and have been found to be helpful and supportive (Frankfort, et al., 2012; Thaler, & Sunstein, 2008; Wildavsky, 2014). As an example, employing a model that breaks through life compartmentalization, daily emails bring home small snippets of academic ideas and motivational examples, which can be accessed by a working mom/graduate student as she waits in the car for her children to finish ballet class. (James, 2015d, 2016).

There is a lot of value in students from diverse races, cultures, situations, and continents sharing difficulties with others. International online asynchronous and synchronous groups aid academic writing while also providing drop in service for students feeling isolated or alone (Daniel, 2007; Eisenbach, 2013; Gardner, & Gopaul, 2012). These help the student who may be wrestling with whether they belong in an academic environment to see themselves in the wider fabric of graduate candidates. These conversations alleviate much of the cultural dissonance and isolation students may feel (Gonzales, 2006).

Independence. Antony, (2002) suggests that graduate education as a whole needs to move beyond the congruence and assimilation model. Fostering independence is a keystone for technology supported learning environments because of the flexibility it offers (Preston, 2014). Because students come to technology as they need it, and because a large part of the graduate process does not change year to year, libraries of options for the adult learner can be developed, offering multiplicity of choice and format: some interactive, game based, or presented in multiple media.

Cohorts foster independence as does group work (Butterwick, et al., 2012). For students separate from their campus due to work or culture, synchronous and asynchronous options can provide similar help in critical thinking, professional involvement, and increased self-awareness, but on a drop-in basis.

Building on the socialization research referred to here, a graduate school or department would need a variety of online, independent options, available 24/7. These would need to be designed to guide yet also allow the student to test their ideas for themselves possibly to include the ability to self-enroll in groups (Carmean, & Frankfort, 2013; Frankfort, et al., 2012; Vekkaila, et al., 2013; Wildavsky, 2014).

Development. Students fall into self-inflicted isolation when they feel unsure of their development (Jazvac-Martek, 2009). This is often during writing which many tackle in the middle of the night after their families are in bed. Feedback at these times is not available. What is needed is a bank of seasoned professors, living in different time zones around the world, who can be dropped in on to ask the quick question as the student writes in their home in the middle of their night after children have gone to bed (James, 2015). While not available yet, this ideal of 24/7 quick graduate feedback 365 days a year is within the reach of a centralized graduate supported technology system.

Of course, most of the areas of graduate developed is currently delivered in both static content, interactive materials and media. As was true for other socialization needs, to capture the requirements of the diverse student population of today, multiplicity of content covered needs to be in a variety of formats to ensure coverage for any of the sub-populations who may be at risk of noncompletion (Barker, 2011; Daniel, 2007; Eisenbach, 2013; Erikson, et al., 2004; Espino, 2008; Felder, 2010; Felder, et al., 2014; Gardner & Gopaul, 2012; Hsu, 2010; Morita, 2000).

Support. What is supportive for one may not be supportive for another and that is where technology supported learning is most effective. Of course development costs can be prohibitive, but the current graduate platform, which will be discussed in more detail in the next section, has a number of tools to aid the graduate student with their academic writing, for instance: articles, videos, checklists, small groups, webinars, a 30-day writing challenge, Q&A, live chat, and coaching (James, 2015d).

In some circumstances, university/business partnerships can greatly reduce costs and increase return on investment by keeping costs down while increasing revenue by catching those students that would have disengaged (James, 2015b). Given the increasing reliance on technology for learning supports from the point of view of the digital native student, deans concerned about socialization should consider looking to technology as a means of making it equitable across student populations.

Advancing a New Conceptual Model

We Can't Tell Who Will Be "At Risk"

Graduate students soon realize that a

multiplicity of agendas and requirements must be negotiated simultaneously. They maneuver through registrations, meeting professors, understanding the demands of their classes, and the graduate studies supports that are offered. Demands are aggravated to the extent students also need to cope with and continue to manage the complexities of work and family. According to Williams (2012) students consistently reported that everything seemed new or unexpected. University requirements are complicated, multifaceted, and inherently contradictory to the rest of the demands of their lives. Every graduate student experiences these stressors (Gardner, 2010). It is part of the process. It is also understood that some sub populations appear to be more at risk than others. Even though we may know which departments have lower completion or which types of students are most at-risk, what these do not answer is how to know who will complete and who will disengage (Daniel, 2007).

From an organizational development point of view, graduate technology supported learning presents a positive area of differentiation in a universities ability to build a solid safety-net for all students (James, 2015b). When successful, the university would gain strength in terms of changing the universities value proposition for recruiting purposes by becoming known as an institution dedicated to helping *all* students through advanced degrees (American Council on Education, 2014).

A conceptual framework that bridges graduate student socialization literature and engagement to technology supported learning is required. Whatever tools are decided upon must work on all platforms and across all devices and be as available to a student 24/7 year round, thus bridging the student and universities time tables. The model discussed here started with the three main graduate processes: research design, academic writing, and critical analysis side-by-side against the angst experienced by students (James, 2015d). At that time, it was proposed that technology should be designed to fill in the gaps between the understanding and execution of the academic processes on the left to the life experience of students on the right. Figure 1 (on next page) lets us evaluate pragmatic applications from a "filling the gap" perspective.

As examples:

1) In the gap caused by confusion about research design standards (ambiguity) on the left and working at home in the middle of the night, isolation on the right, were installed online self-assessment tools. These allow students to test their ideas interactively against examiner criteria, improving their ideas (and score) as they go proceed through the tool. The best thing is that they are always

Figure 1. Simple conceptual model: Filling the gaps with technology ●
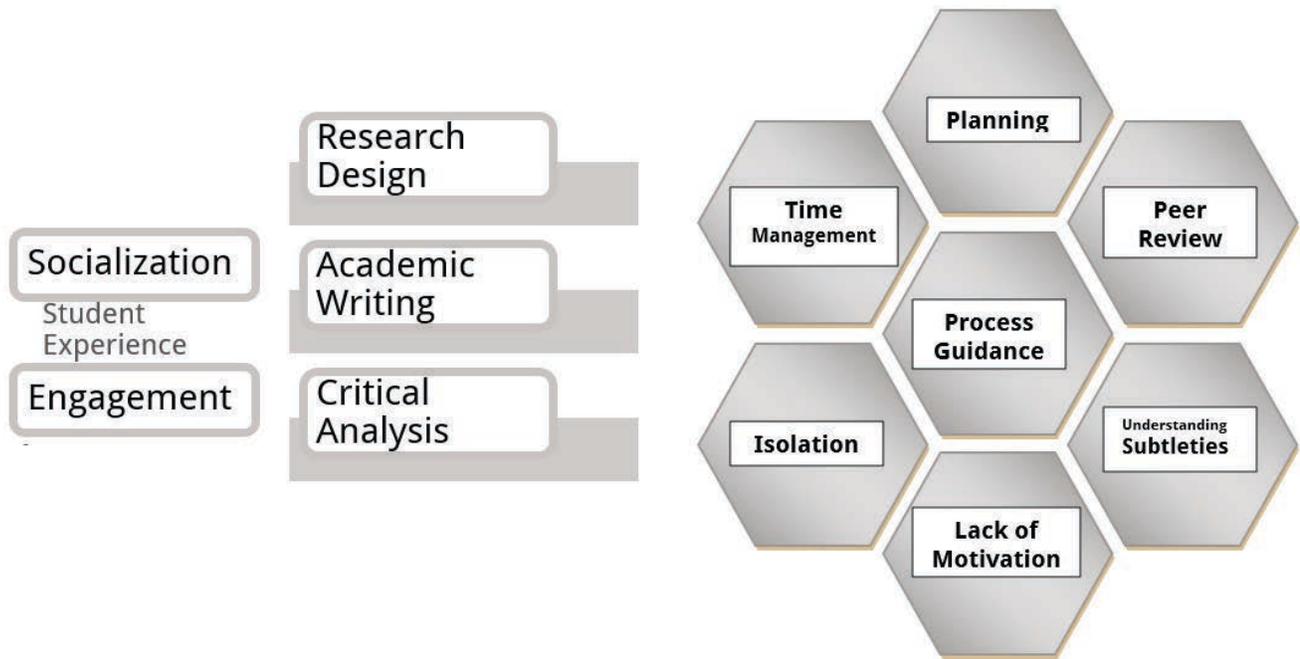
available.

2) In the gap between the challenges faced by the mature student whose work took them away from their academic writing for a few months (time management, planning and isolation on the right) and the need for critical analysis (on the left) to finish their dissertation, there were multiple technologies including: webinars, live chat, online groups for those lingering too long, etc. (James, 2015d).

Graduate Technology Supported Learning Platforms

That model still holds as an aid to conceptualize both the difficulties experienced during graduate work, especially for the non-traditional student, and the multiple technologies that can address those gaps, but it was not precise and did not lead to further planning or implementation strategies. Figure 2 represents a new model with the Gardner (2006) categories of socialization breakdown at the bottom. This represents the long-term university end goal as wanting to have as many strategies in as many modalities as possible to ensure socialization adequate to the need for all students, no matter what their style of learning. The middle rows are general classifications of technological online content or media.

For example, a technological strategy to address academic writing, as an example, might employ written materials, spoken, exercises, interactive self-assessment, game based learning,

Figure 2. Conceptual elements for graduate technology supported platform
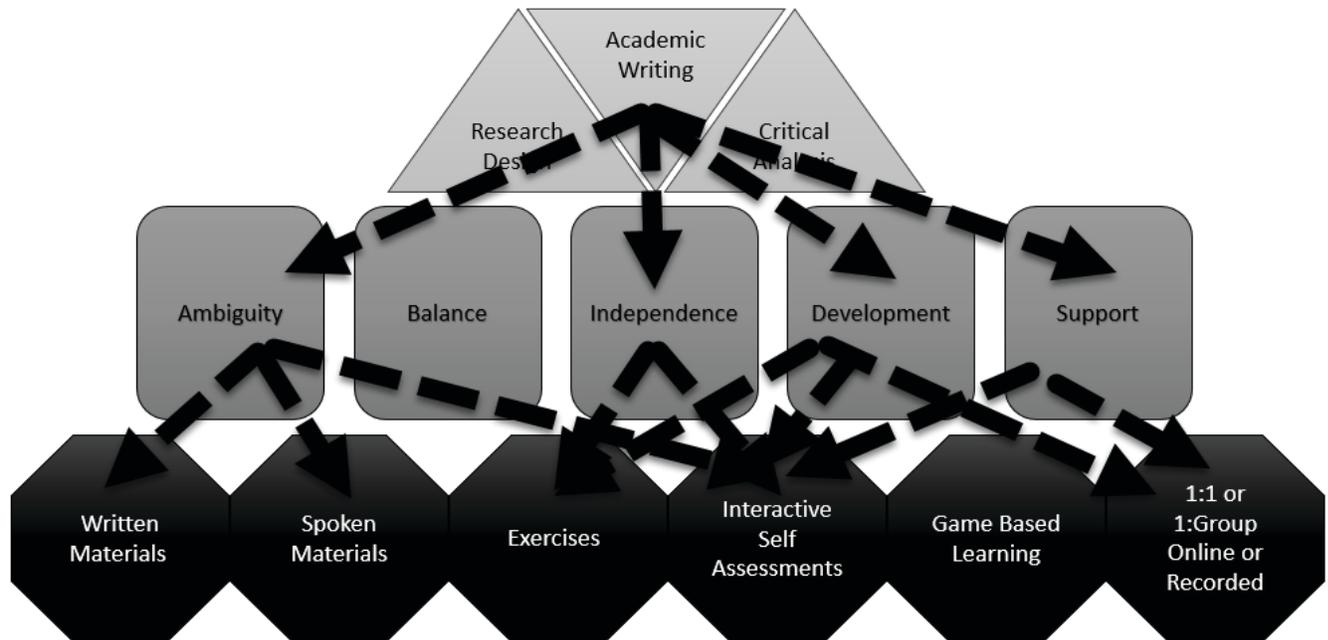
and one-on-one or one-to-group strategies. Exercises would be implemented as part of the one-to-group work. This results in the conceptual diagram in Figure 2 by considering the online tools we develop and the effect they have on the various issues in socialization we can grow a series of tools best suited to be found supportive by all students.

The effects of strategically designed technology are cumulative, creating a web of interactions that develop when only a few tools are strategically designed. In this case, written, video and synchronous online groups all targeting academic writing are portrayed.

Technology continues to develop and new options are experimented with all the time. However, a selection of those which are already operational for 24/7 delivery 365 days a year, on

graduate socialization platforms include:

1) To ensure mastery of research design and protect against ambiguity, multiple types of materials have been developed in all technology categories.

- Written materials are segmented into minor and major milestone completion which also provides support and motivation and are delivered in multiple formats so that adult learners can choose those that best suit their needs/ timetables.

- Spoken materials include webinars and videos for 24/7 deliver (80 a year are produced).

- Written exercises are part of the phased content while group exercises are used

in drop in synchronous group activities.

- Interactive tools allow students to self-assess mastery against examiner level criteria prior to showing their work to their supervisors.
- Game-based learning offers scenarios to self-check their understanding of situational bias.
- Finally, synchronous groups allow student to read what they have written to check that it makes sense to others.

Operationalizing this model depends on economies of scale. No university will be able to both keep up with new technology development and suffer the cost of continual development. At the same time, graduate education is changing and while tools to support the standard dissertation or thesis model of completion are in place, additional tracks are needed as professional graduate programs expand and alternative types of capstone experiences are designed. The potential of this model lies in not only in its economy of scale of financial resources but also the time it frees up for university professors and staff. As each university partner responded to the platform, improvements would be realized throughout. In a similar fashion, because students sign onto their university portal, personalized for their school, they experience the full range of tools as socialization just for them.

Empirical Evidence and Work to be Done

Do university organizations need to make this change?

In a survey done for our company (n= 138), asking (post) graduate students the degree to which they agreed with Gardner's concepts resulted in a resounding agreement with these five issues. Ninety percent of the students who answered were from North America or Europe although South America, Africa, and Asia/Pacific Rim were represented. Over half of them had considered dropping out of their degree programs; about 50% reported balance and support as the area that was enough of a challenge to cause them to disengage, 28% said the same about ambiguity and independence. Only 20% saw skill development as a severe challenge; however, 40% said it came up once or twice a semester. These are significant figures for those most likely to be at-risk of disengagement.

Do Graduate Technology Support Platforms Work?

Doctoral students have increasingly used technology as a system of support (Mantai, 2014). The fact that many of the resources they find exist in the "grey area" is worrisome (Aitchison, & Mowbray, 2015). As mentioned, one peer reviewed graduate technology supported platform exists, and has been adopted, first by four institutions in Ireland, and more recently, is being tested in the

US.

The following engagement data comes from our flagship university, a large urban institution, who prefer to remain anonymous for this publication. Their department of graduate studies found financial support from several schools: Nursing, Education, and Business. The first year they enrolled 134 students for the 2015-2016 school year. They were pleased with the adoption results and survey data and (as of this publication) and expect expansion to another two departments in year two. It must be kept in mind that to the student this is just another tool from their university, an adjunct site they are entering that allows them to interact in the wider international graduate community, but that looks and feels like their university's online presence. Each university with this model has their own, bespoke portal.

Engagement data the first year demonstrated equal usage from full time and part time students, on campus or at a distance. Approximately one third used the tools automatically available on the site, 22% became power users (visiting multiple pages regularly, tracking milestones and using one of the opt-in services for academic writing). During the previous year 50% attended webinars and more than that amount showed interest in this format in the first 6 weeks of the fall university term, 2016.

The Graduate School office questioned to what extent we were catching those most likely to disengage and decided to consider the evidence for those who were in years three plus or who responded with low motivation. While 71% of those surveyed said they felt strong and worked at least one day a week on their dissertation/thesis, 29% were neutral, partially or completely demotivated and reported that they were working less than 2 days a month. With the personalized level of data back from these services, students who are low in motivation can be sent specialized emails introducing them to a range of motivational services. The new group for lingerers, who feel they have been at it too long, has attracted 6% of the total population, which equates to about 8% of those students year three or later. Eight percent of these students opted in for 365 daily motivational emails in 2015-2016 as well, confirming the need for inspiration coming from the university but available outside campus.

There is still much that can be done to both personalize these technology services for each university and to embed technology in support of equalization within supervision or advisement. Two examples of how the technology could be used by faculty advisors/supervisors:

1) A supervisor confronted with a student who does not appear to be making significant progress, instead of "giving them the benefit of the doubt" and letting them continue,

suggests that the student: 1) begin to track minor as well as major milestones through the site each month, 2) go through the automated self-assessments, and/or, 3) begin the practice of attending webinars live or by recording.

2) In an advisement meeting the supervisor sees that, while the student in front of them seems to have good ideas, their writing is not up to academic standards. They wonder if it could be due to issues involved with balance with their employment responsibilities, language or culture. Not prepared to address these issues directly but wanting the student to find the help they need they ask them if they: 1) have read/listened/gone through the content on their university. doctoralnet.com site, 2) seen what myriad of tools or groups were available to academic writing, 3) reminded them that international special interest groups might help them find additional supports.

Discussion

That there will continue to be socialization issues within graduate schools seems to be self-evident because of the diversity of background, theoretical, ontological, and epistemological ideals in university graduate life (Barker, 2011; Dunning, 2013; Gardner, 2008; Mewburn, 2011). That

technology has a part to play in filling the gaps and reaching the outlier students, who also happen to be the growth market, also seems self-evident (Carmean & Frankfort, 2013; Frankfort et al., 2012; Hsu, 2010). Up until now, universities have let students go out and find tools on their own; however, there is a need to partner with academically driven organizations to ensure proper use of information ethics (Aitchinson, & Mowbray, 2015).

Whether and to what extent universities will be able to manage to adopt the partnerships that will successfully improve their graduate department value propositions will likely fall across the continuum from those who are innovators and choose early adoption through to those who maintain the medieval standard of one on one patterns of support for as long as they are able. Certainly, lessons learned from organizational development and the adoption of technology advise treading lightly and testing at every juncture.

Graduate schools and departments will continue to recruit from a wider base of student students. What is needed is continued advocacy and support for all students to create a thick enough safety net to capture greater numbers before they disengage. Research has shown us that Gardner's model of the five categories of socialization is apt and it remains to us to operationalize them to the best of our ability.

One certainty is clear: graduate technology supported socialization is just beginning and more and more students are anxious for the opportunity to join the student who wrote to her graduate department to say. *"Thank you for your webinars. I watched the one about why it takes so long for some of us and was very impressed by your socialization statistics. It was right about me. Also, I appreciate your support that helped me emotionally and raised my awareness and understanding. I look forward to investigating the rest of your technology system and am encouraged to have it available."* (VS, 2016)

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